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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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CHRISTIE, PARKER & HALE, LLP			YAM, STEPHEN K	
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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/070,077	Applicant(s) FLEMING ET AL.	
	Examiner Stephen Yam	Art Unit 2878	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 May 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☒ Claim(s) 7 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 June 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This action is in response to Amendments and remarks filed on May 26, 2004. Claims 1-7 are currently pending.

Claim Objections

1. Claim 1 is objected to because of the following informalities:

In Claim 1, lines 5-6 and 16, "said path" should be replaced with "said predetermined path" to eliminate confusion, since there are multiple defined paths in Claim 1.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 4-7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In Claim 4, it is unclear how a cable can have both a "first" speed and a "second" speed, as a moving object generally only has a single moving speed. It is also unclear whether the "first", "second", and "operating" speeds (defined in Claim 5) are all different speeds, identical speeds, or related speeds.

Claims 5-7 are indefinite by virtue of their dependency on an indefinite claim.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claim 4 is rejected under 35 U.S.C. 102(b) as being anticipated by Pijls US Patent No. 3,594,755.

Regarding Claim 4, Pijls teaches (see Fig. 5) an apparatus for detecting speed in a cable (1) having at least two twisted elongate elements (inherent property of yarn) traveling along a predetermined path (see Fig. 1), the apparatus comprising a first light source (9) projecting light having a first light path (I) onto the cable, a first receiver (10, 11) positioned about the predetermined path and the first light source so as to receive a first shadow cast by the cable as the cable interrupts the first light path from the first light source to the first receiver, the first receiver generating a first frequency signal (out of (11)) based on the first cast shadow (see Fig. 5), a first filter (2) having a first passband based around a frequency associated with a first speed of the cable (see Col. 1, lines 61-67 and Col. 2, lines 68-75), the first filter receiving the first frequency signal and generating a second frequency signal (S_r), and a processor (3) processing the second frequency signal and determining a second speed (V_g) of the cable (see Col. 2, line 73 to Col. 3, line 5). Although the preamble of the claim recites "an apparatus for detecting... twist rate", no limitations or elements within the body of the claim provide support for enabling detection of a twist rate, so therefore, the intended use for the apparatus of detecting twist rate is not given patentable weight.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Massen US Patent No. 4,887,155.

Regarding Claim 1, Massen teaches (see Fig. 1) an apparatus for detecting a twist rate in a cable (10) having at least two twisted elongate elements (see Col. 1, lines 12-16) and traveling along a predetermined path (see Fig. 1), the apparatus comprising a first sensor (left part of (26) and left part of (12)) having a first light source (left part of (26) providing light that enters left part of (12)) and a first detection means (left part of 2-D camera (12)) positioned about said predetermined path so that the cable interrupts a first light path from the first light source to the first detection means to cast a first varying shadow (see Col. 5, lines 18-20) on the detection means as the cable travels along the predetermined path, and means for processing (16, 18, 20) outputs of the first detection means with an actual speed (v) of the cable to determine an actual twist rate for the cable (see Col. 5, lines 30-34), characterized by a second sensor (right part of (26) and right part of (12)) spaced apart along said path a predetermined distance from said first sensor (see Col. 2, lines 41-44), the second sensor having a second light source (right part of (26) providing light that enters right part of (12)) and a second detection means (right part of 2-D camera (12)) positioned about said predetermined path so that the cable intercepts a second light

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path from the second light source to the second detection means to cast a second varying shadow (light blocked by right part of (10)) (see Col. 5, lines 18-20) on the second detection means as the cable travels along the predetermined path. Regarding Claim 3, Massen teaches (see Fig. 1) a method for detecting a twist rate in a cable (10) having at least two twisted elongate elements (see Col. 1, lines 12-16) and traveling along a predetermined path (see Fig. 1), the method comprising the step monitoring a first variation in profile (see Col. 5, lines 37-40) of the cable as it passes a first location (left range of (12)) along said path to provide a first measurement signal (outputs from left pixels of (12)) and processing the first measurement signal with a signal to determine the twist rate (see Col. 5, lines 30-34) characterized by the step of monitoring a second variation in profile of the cable (see Col. 5, lines 37-40) as it passes a second location (right range of (12)) along said path spaced a predetermined distance from said first location to produce a second measurement signal (outputs from right pixels of (12)), and processing (20) the first and second measurement signals. Massen does not teach producing a signal representative of the actual speed of the cable- however, Massen teaches taking consecutive images while the cable is moving (see Col. 5, lines 37-40)- since speed is inherently the distance of movement over a specified time period (time between images), it is well known in the art to use consecutive images in order to determine traversed distance, and therefrom, determine the speed of a moving object. It would have been obvious to one of ordinary skill in the art at the time the invention was made to produce a signal representative of the actual speed of the cable in the method of Massen, to control the rate and lengths of produced cable and increase the reliability of the twist rate measurements.

8. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Massen in view of Pijls.

Regarding Claim 2, Massen teaches the apparatus in Claim 1, according to the appropriate paragraph above. Massen does not teach a filter for each sensor, having a passband based around a frequency corresponding to the speed of the cable along said predetermined path. Pijls teaches (see Fig. 5) a similar device with a sensor (2, 9, 10) to determine the actual speed of a cable (1) (see 2, lines 73-75 and Col. 3, lines 39-43 and 53-56), the sensor having a filter (2) having a passband based around a frequency corresponding to the speed of the cable along the predetermined path (see Col. 2, lines 69-75). It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a filter having a bassband based around a frequency corresponding to the speed of the cable along the predetermined path, as taught by Pijls for each sensor in the apparatus of Massen, to provide a secondary cable speed detection system from the detection of projecting fibers in Massen (see Col. 5, lines 35-36 and Fig. 2) to reduce unwanted signal components to improve the speed detection, as taught by Pijls (see Col. 1, lines 9-12, 52-56, and Col. 2, lines 70-75).

9. Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pijls.

Regarding Claim 5, Pijls teaches the apparatus in Claim 4, according to the appropriate paragraph above. Pijls does not teach the second speed used to adjust an operating speed associated with the cable. It is well known to adjust a speed of a moving object when it is known, to provide further control and to maintain operating parameters. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the second

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speed to adjust an operating speed associated with the cable in the apparatus of Pijls, as it has been held that the provision of adjustability, where needed, involves only routine skill in the art.

In re Stevens, 101 USPQ 284 (CCPA 1954).

Regarding Claim 6, Pijls teaches the apparatus in Claim 4, according to the appropriate paragraph above. Pijls does not teach a second light source, receiver, and filter, similar to the first light source, receiver, and filter, respectively, and a comparator receiving the second frequency signal from the first filter and a fourth frequency signal from the second filter and generating a difference signal. It is well known in the art to provide multiple detectors for a sensor system, to increase redundancy in case of component failure, and to provide a component for detecting such component failures. It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a second light source, receiver, and filter, similar to the first light source, receiver, and filter, respectively, and a comparator receiving the second frequency signal from the first filter and a fourth frequency signal from the second filter and generating a difference signal, in the apparatus of Pijls, to reduce detection error by increasing redundancy and providing detection of a light source or receiver failure (when two identical sensor systems output different values).

Allowable Subject Matter

10. Claim 7 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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11. The following is a statement of reasons for the indication of allowable subject matter:

The invention as claimed, specifically in combination with a first and second light receiver each generating frequency signals, generating a difference signal from a second frequency signal from a first filter and a fourth frequency signal from a second filter, to adjust an operating twist rate associated with a cable, is not disclosed or made obvious by the prior art of record.

Response to Arguments

12. Applicant's arguments filed May 26, 2004 have been fully considered but they are not persuasive.

Regarding Applicant's arguments that speed calculation is not necessary, Applicant argues that Massen essentially states that data can be obtained from the two-dimensional image whether the image is picked up from a stationary yarn or one moving with a speed. Examiner asserts that although the invention of Massen can be operated both while stationary or moving, it will benefit from optimization of the CCD image sensor based on the moving speed of the yarn. For example, the exposure time of the CCD can be adjusted according to the moving speed of the yarn to ensure sufficient contrast while preventing blurring of the images if the speed of the yarn is too great.

Applicant also argues that for calculating the speed of the yarn in the invention of Massen according to the left and right division of the image sensor, a marker is needed on the yarn to allow it to be detected by the left part of the radiation source and then by the right part of the

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radiation source, with an elapsed time between the two measurements computed. Examiner asserts that since the sensor of Massen is two-dimensional, it contains a plurality of rows of photodetector elements, which can be arbitrarily grouped into "left" and "right" parts as appropriate. Since Applicant's claim language does not recite specific steps of processing the outputs of the first and second sensors individually or in combination, Massen still utilizes the outputs of the first and second sensors (in combination, forming complete CCD images), and, in combination with well known methods for speed determination as described in the rejection above, provides the calculation of the velocity of the cable through successive CCD images. Examiner asserts that a detection marker on the yarn is not necessary, as the principle of velocity determination operates through the determination of the image shift through multiple successive images during a pre-determined time interval, utilizing features within object(s) captured in the images.

Applicant further requests that Examiner provide a reference to support Examiner's claim that it is well known in the art to use consecutive images to determine traversed distance. In response, Examiner submits Hirzel US Patent No. 4,495,589, which provides velocity determination through the position shift calculated from an image shift from two images captured between a pre-determined time interval (see Abstract, Col. 2, lines 3-30, Col. 5, lines 43-67, Col. 6, lines 43-53).

Conclusion

13. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen Yam whose telephone number is (571)272-2449. The examiner can normally be reached on Monday-Friday 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on (571)272-2444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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PATENT EXAMINER